



Navy Region Hawaii & Housing Partner Launch

First Resident Energy Conservation Program

**Plan Encourages & Rewards Energy
Conservation at Military Housing**



Hawaii may be paradise to many, but it also has the dubious distinction of having the highest energy rates in the United States. So when it was time for the Department of the Navy (DON) to roll out a new Resident Energy Conservation Program (RECP), Navy Region Hawaii was the perfect location for a pilot program.



Navy Region Hawaii and Forest City discovered that residents in the newly metered homes were using up to three times as much energy as comparable private sector consumers.

The Navy's RECP was created to align with the Department of Defense and DON's energy conservation and energy security initiatives to reduce dependence on foreign oil and other fossil fuels, and to reduce the consumption of utilities.

How RECP Began

Military housing in Hawaii is managed by Forest City Military Communities, LLC, the Public Private Venture (PPV) housing partner with Navy Region Hawaii. Forest City received the contract for constructing and managing military housing in May 2004. Included in the agreement was a provision for residents to self-pay for utilities. The provision follows a 1998 directive from Office of the Secretary of Defense, transferring responsibility for utility payment from PPV management to residents.

Initially, utility payments were included in service members' Basic Allowance for Housing (BAH). The BAH is an allowance for rent, utilities, and renters' insurance included in service members' paychecks. The only problem with the arrangement was that the BAH is calculated based on average prices for rent and utilities in a comparable private sector neighborhood. If residents used more than an "average" amount of electricity, or if rates went up, the housing partnership had to absorb the cost. More partnership funds spent on utilities means less for other uses like taking care of the properties and other neighborhood amenities.

Beginning in 2004, Forest City began to install electric meters in new homes. What they found surprised them.

The Real Cost of Electricity

The working group formed by Navy Region Hawaii and Forest City discovered that residents in the newly metered homes were using up to three times as much energy as comparable private sector consumers.

The partnership realized that a conservation program needed to be developed soon, so in 2009 another working group was formed. This group included the PPV partners,

Naval Facilities Engineering Command (NAVFAC) and the PPV partnership in South Carolina, Atlantic Marine Corps Communities (AMCC) at Tri-Command.

The group looked to the Air Force and Army for guidance, as they had already implemented programs similar to the Navy's RECP that transfer responsibility for utilities from the project to the resident. With these programs as blueprints, the group first installed meters in all remaining housing in Hawaii and South Carolina.

PV arrays are standard on this military residence in Mololani.
Forest City Military Communities—Hawaii



They found similar high rates of consumption across the board. This was primarily because of the lack of a connection between the residents' rent and the amount of electricity consumed. In particular, there was no information being provided to a resident about their individual consumption, and no program to hold them accountable for the amount of electricity they consumed. The working group determined that the program would need to include a monthly statement that simply explained to residents how much electricity they were using and how that compared to their peers in their neighborhood and then hold them accountable to pay for excess usage.



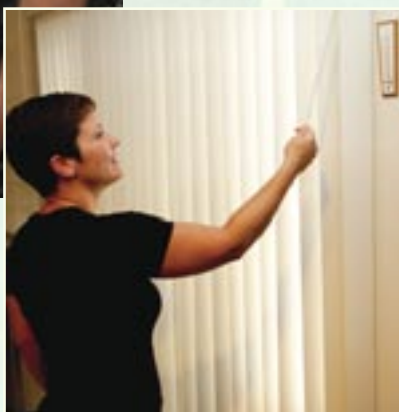
FAR LEFT: Information Systems Technician 1st Class (IT1) Joshua Brown, assigned to Joint Base Pearl Harbor-Hickam, checks the air filter in his air-conditioning unit during routine maintenance. The Navy's RECP was created to align with the Department of Defense and DON's energy conservation and energy security initiatives to reduce dependence on foreign oil and other fossil fuels and to reduce the consumption of electricity.

LEFT: IT1 Joshua Brown plugs in his electronic devices using a type of power surge known to reduce wasted stand-by energy.

MC2 Nardel Gervacio

Judy Brown, wife of IT1 Joshua Brown, closes the window blinds to prevent heat from entering and keep their home cool.

MC2 Nardel Gervacio



Under the RECP, residents who use more than the calculated average amount of power for their home's "like-type group" pay an additional amount. (Housing units are classified into like-type groups by neighborhood, size, and year built.) Conversely, a resident's monthly usage is under the normal usage band, which is the average of a like-type group of homes plus and minus a buffer currently set at 10 percent, they receive a rebate. Wounded Warriors and Exceptional Family members, as well as military residents with a significant health condition that drives excess usage, may request a waiver for the program.

Following the conclusion of the joint working group's effort and adoption of the RECP by the DON, the pilot RECP was begun at Navy Region Hawaii, Marine Corps Base Hawaii, and AMCC at Tri-Command in South Carolina. The results of the one-year pilot program were very encouraging—a nearly ten percent decrease in electricity throughout the year.

The pilot program in Hawaii created a utility cost avoidance in excess of \$1 million in its first year due to lower electricity consumption. By not spending this \$1 million on utilities, the partnership was able to use these savings for



IT1 Joshua Brown and his family pose for a portrait in front of their residence. Brown and his family maintain an energy-conscious lifestyle and take steps to create a home that uses less electricity.

MC2 Nardel Gervacio



If a resident's monthly usage is under the normal usage band, which is the average of a like-type group of homes plus and minus a buffer currently set at 10 percent, they receive a rebate.

offsetting higher utility rates as well as investment savings for future neighborhood repair and improvement projects.

How It Works

Forest City calculated a monthly energy use average for each like type group of housing, including approximately 6,000 Hawaii PPV homes. In South Carolina, a similar average was established by AMCC at Tri-Command.

Every month, metered utility data are collected from all military tenant-occupied homes in the like-type groups to develop an average usage.

For several months prior to the implementation of 'live billing,' residents received mock electricity bills to alert them as to how their electricity consumption compared to the monthly average for their like-type group. When the program went live, residents were allowed a 20 percent buffer before any action was triggered with respect to their consumption—that is, resi-

dents whose monthly utility consumption was 20 percent above or below the normal usage band for their like-type group would not incur a charge or receive a rebate (credit).

In October 2012, after 21 months with a 20 percent buffer, the buffer zone was narrowed to 10 percent above and below the average monthly usage. This was done in an effort to encourage further conservation, and to better align the DON's RECP with the Air Force, Army, and

About 50 percent of Forest City residences are new construction, incorporating energy-efficient features throughout.

Forest City Military Communities—Hawaii



This Net Zero home in Catlin Park, Hawaii was a team effort between Forest City and the Department of Energy. The home produces more energy than it uses over the course of a year.

Forest City Military Communities—Hawaii

Marine Corps. (The Army program utilizes a buffer as low as five percent in some locations). Residents receive a rebate (credit) if they are 10 percent or more below the normal usage band, or pay an out-of-pocket charge if they use more than 110 percent of the average.

As residents modified their energy consumption habits (i.e., adjusting thermostats and turning off unnecessary lighting and idle electronics), average energy usage steadily declined. By January 2013, two years into the RECP, Hawaii Navy residents had on average decreased their electricity

Saving Energy All Across Hawaii

Hawaii's near perfect weather makes it an ideal location for solar energy production. A pair of projects in Navy Region Hawaii are taking full advantage of this plentiful natural resource.

In late 2012, Forest City completed construction of the largest utility-scale solar farm on Oahu. The 1.23-megawatt solar farm lies on Navy land on the Pearl City Peninsula. Hoku Solar installed more than 4,300 photovoltaic panels at the utility-scale solar farm, which will provide electricity to 150 to 250 military homes. The project was Forest City's fourth utility-scale solar farm on Oahu, and was a partnership with NAVFAC, Hawaiian Electric, and American Savings Bank.

In January 2013, the Navy completed an environmental assessment for a 5-megawatt solar array in West Oahu. The \$30 million project, Kalaeloa Renewable Energy Park, will consist of 21,000 photovoltaic panels on 20 acres next to a former Marine Corps' landing strip. Kalaeloa Ventures, LLC will sell the energy to the Hawaiian Electric Company through a 20-year power purchase agreement. The solar park will help to power approximately 1,000 homes per year.

In addition to energy savings achieved through changes in energy consumption in military housing, Navy Region Hawaii is also realizing savings through more energy efficient buildings.

Leadership in Energy and Environmental Design (LEED) is a program that provides third-party verification buildings have achieved a certain level of energy efficiency.

Marine Corps Base Hawaii has achieved or targeted LEED certification for several properties managed by Forest City. These include:

- Waikulu neighborhood: LEED certified for neighborhood development
- Camp H. M. Smith: LEED Gold certified for homes
- Mololani: LEED Platinum certified for homes
- Phase IV Completion Project: targeting LEED Silver certification for homes

- Kaneohe Bay Management Office: targeting LEED Silver certification

Navy Halsey Terrace Neighborhood Community Center

The Halsey Terrace neighborhood was one of the first five neighborhoods transferred into the PPV entity in Hawaii in April 2004. This 477-housing unit neighborhood was completely demolished and rebuilt. Included in the neighborhood was a new two-building community center and swimming pool.

With savings built up during the reconstruction of the neighborhood, Forest City purchased a PV system to place on the roof of the two community center buildings. Because of the high price of electricity in Hawaii, the investment in the PV system was certain to have a favorable payback.

The electricity generated by the PV system today helps to offset the electricity purchased for the houses in this neighborhood. The PPV project owns the system, so all of the electricity generated over the 20-year expected life expectancy is "free" to the project. The 107-kilowatt system produces about 14,000 kWh per month, which is equivalent to the consumption of approximately 15 houses. As electricity consumption decreases over time in response to the RECP and other initiatives, the number of houses supplied by this system is expected to go up.

Forest City Energy Smart Initiative

In an effort to help move Forest City Navy and Marine Corps families toward a more efficient lifestyle, Hawaii Energy is partnering with Forest City on an energy conservation campaign. As mentioned above, the initiative included the development of targeted messages delivered to new and old residents of Forest City. The goal of the initiative is achieve a minimum 1.5 percent energy reduction per home per year. The program kicked off in May 2012, and achieved instant results. Forest City residents reduced total energy consumption by 674,956 kWh during June and July 2012.



Air conditioning used far and away the most kilowatt hours.

consumption by 10.5 percent from a starting point of 1,300 kilowatt hours (kWh) for the month of January 2011 to an average of 1,130 kWh for the month of January 2013.

Saving Specifics

The Forest City PPV had assistance from the University of Hawaii School of Architecture and Hawaii Energy in developing guidelines for reducing consumption. The school monitored electricity use at 10 Forest City residences at a time on a revolving 30-day schedule to determine what the largest offenders were in terms of energy use. Not surprisingly, air conditioning used far and away the most kilowatt hours. In second place was hot water—which was a bit of a surprise as units are furnished with solar hot water systems. In third place was the collective effect of plug loads (i.e., small appliances, entertainment systems).

The results of this study resulted in a printed guide for all new Forest City residents covering simple, yet effective energy conservation methods. This guide, plus smaller reminders strategically located in the housing units themselves, provide new and continuing residents with the road map for quicker conservation and for starting their lease term with a lower baseline at the outset.

During the University of Hawaii study, it was determined that some residents were defeating the solar heater's timer function, resulting in higher electricity costs. This prompted Hawaii Energy to initiate a follow-on study at Forest City by installing detailed hot water monitoring in 15 homes. This monitoring program is still underway.

“The key to helping program participants change their energy-use behavior is through regular and consistent education (of both residents and staff) about how to most easily save electricity,” said Will Boudra, vice president of development at Forest City.

The PV arrays on this community center generate about 14,000 kWh of power per month.

Forest City Military Communities—Hawaii



This 1.23-megawatt solar farm on Oahu will provide electricity to 150 to 250 military homes.

“The first time we see a prospective military resident is when they come to the leasing office to look for a house,” said Boudra. “At that time, they begin to hear the PPV project energy conservation message.”

Then when someone from the leasing team takes them to see a house, they hear the conservation message again:

1. Go easy on the air conditioning.
2. Make the best use of the solar thermal domestic hot water system.
3. Be mindful of the cumulative effect of unnecessary plug loads.



Damage Controlman (DC1) Amy Lynn Huitrado, assigned to Joint Base Pearl Harbor-Hickam, checks the status of an electric water heater time switch during a routine check. The time switch allows the customer to shift electricity use into the 'off-peak' time periods in an attempt to save utility costs. DC1 Huitrado and her family maintain an energy conscious lifestyle and take steps to create a home that uses less electricity and fewer fossil fuels. The Navy's RECP kicked off in May 2012, and achieved instant results. Forest City residents reduced total energy consumption by 674,956 kWh during June and July 2012.

MC2 Nardel Gervacio



DC1 Huitrado checks the status of energy use on e-gauge, which can be used to monitor whole-house consumption.

MC2 Nardel Gervacio

"These messages are repeated during subsequent follow-on contact with property management and maintenance associates," Boudra said.

Residents' Reactions

A series of community meetings were held with residents both at the RECP inception in the summer and fall of 2010 and again in the summer and fall of 2012, as the buffer was narrowed from 20 percent to 10 percent. These community meetings were co-hosted by Navy Region Hawaii, Joint Base Pearl Harbor-Hickam, and Forest City leadership, and provided an effective forum both to further educate the PPV residents on the objectives and mechanics of the program and to answer residents' questions about the program. (A town hall meeting was also conducted in South Carolina.)



DC1 Huitrado poses for a portrait in front of her residence.

MC2 Nardel Gervacio



In addition to conserving hot water, lighting, and appliance use, adjustments to home thermostats can be an important energy saver.

As might be expected, resident reactions to Navy Region Hawaii's RECP have been somewhat mixed. However, according to Boudra, two years into the program, the number of people receiving a rebate is about the same as the number of people paying an overage.

Elizabeth Tsan, stationed at Pearl Harbor, moved into Forest City around the time the "test billing" period was beginning. She and her husband have consistently stayed \$70 to \$90 below the buffer zone each month. "We never had a problem staying within the buffer zone because we were very conscientious about saving money, she stated. "We unplug everything except the microwave," she said, adding that she uses the clock on the microwave to ensure she'll get to work on time.

Tsan also line-dries clothing instead of using the dryer, opens up windows whenever possible instead of using air conditioning, and makes frequent use of a charcoal grill instead of the oven.

Tsan feels that the program is "pretty good," but hopes that eventually everyone can stay in the buffer zone so that no one has to pay more than anyone else.

DC1 Amy Huitrado, also moved into Forest City housing during the test billing period. This was her first experience with PPV housing, so she was used to paying her own utilities. What she wasn't used to was the high cost of electricity in Hawaii.

One of the energy-saving features of this Forest City residence in Pa Honua is solar-powered hot water.

Forest City Military Communities—Hawaii



The Marine Corps Base Hawaii housing office and its solar array.
Forest City Military Communities—Hawaii

"We don't turn the air conditioner on unless it's eighty degrees or more," she stated. "We use ceiling fans." DC1 Huitrado says that she and her husband usually qualify for a rebate if they don't use air conditioning. If they do, they normally stay within the buffer. But, she added, "If we have company, we pay."

Other energy-saving measures the couple employ include using lamps instead of overhead lights, unplugging everything, and making sure all light bulbs are energy-efficient. As one of the homes being monitored

When Will the RECP Program Start at My Installation?

The current roll out schedule for Phase I of the RECP includes units that have individual electric and gas meters and processes in place to bill residents. Follow-on phasing timelines are yet to be scheduled:

- Hawaii: Live billing started January 2011 (96 percent of homes)
- Southeast (FL, GA, MS, SC, TX): Live billing started April 2013 (88 percent of homes)
- New Orleans (LA): Live billing was expected to start September 2013 (79 percent of homes)
- Midwest (IL, TN): Live billing was expected to start September 2013 (80 percent of homes)

- Northwest (WA): Live billing started August 2013 (80 percent of homes)

- Southwest (CA, NV): Live billing expected to start October 2013 (42 percent of homes)

- Mid-Atlantic (DC, MD, VA, WV): Live billing expected to start October 2013 (100 percent of homes)

- Northeast (CT, ME, NJ, NY, RI): Live billing expected to start October 2013 (50 percent of homes)

For more information about when the RECP will roll out for a specific Navy installation or neighborhood, contact your local Housing Service Center.

Source: www.cnic.navy.mil/ffr/housing/recp.html

by the University of Hawaii project, the couple has the advantage of seeing what items in their home use the most energy. This knowledge prompted them to cut down on dryer use ("it uses a ton of power," she stated), and using a toaster oven instead of the regular range.

DC1 Huitrado is a resident advisor for her neighborhood, which means she brings neighbors' concerns to Forest City management, and keeps them informed of new developments.

"The bills are coming down," she said. "But the cost of power is going way up next year." Though suppliers' costs are poised to spike in 2014, DC1 Huitrado also voiced optimism that Forest City is trying to help. "They're hoping to install PV panels on all the homes here, which should bring the costs down," she said.

In short, DC1 Huitrado has been pleased with her experience in PPV housing. "I'm grateful for what I have—a nice house and yard."

The RECP Expands

As a result of the pilot program's success, Commander, Navy Installations Command (CNIC) began rolling out the program to the rest of the DON's PPV housing that is metered and ready in October 2012. The rollout mandates that all projects will use a 10 percent buffer above and below the average monthly electricity usage by Navy PPV residents.

One of those locations is Naval District Washington, where the mock billing period began July 1, 2013. Residents will receive mock bills for three months so that they can evaluate their home energy consumption before live billing begins on October 1, 2013.

In a video message to the Fleet, Vice Admiral William French, CNIC, stated, "It's important to note that you and your family will reap the benefits of the money that is saved by this program—first with the refund from energy savings you and your family create by staying below the average normal usage rate, and second, the vast majority of the RECP cost savings will be reinvested back into the local PPV community to sustain high-quality homes and neighborhood amenities such as playgrounds, facilities and landscaping."

The RECP will have no impact on residents' BAH. According to CNIC, an allowance for normal utilities is a part of the BAH, which includes allowances for utilities, gas or other heating fuels, and water/sewer. The BAH includes the cost of utilities based on averages from residents living in the private



The RECP is intended to encourage residents to achieve normal usage and to reward them for conservation beyond normal expectations.

sector. The RECP is intended to encourage residents to achieve normal usage and to reward them for conservation beyond normal expectations.

CNIC recommends that those who wish to conserve make easy changes around the house. In addition to conserving hot water, lighting, and appliance use, adjustments to home thermostats can be an important energy saver. For example, in the winter months, setting the thermostat any higher than 70 degrees has the possibility to add more than seven percent to the bill.

Residents should also check and change their air filters because clogged filters make heating and cooling systems work harder. The proper use of ceiling fans helps circulate air to aid heating or cooling. And sealing windows and doorways can also help conserve on heating and cooling.

“Over the years we all have become attached to our ‘extras’ like a second or third refrigerator or freezer, year-round air-conditioning, and multiple entertainment systems,” says Boudra. “Private sector residents in Hawaii quickly learn to curb their customary use of electricity. PPV residents are learning to do the same.”



A list of frequently asked questions, tips on saving energy, and other communications about the program can be found by visiting www.cnmc.navy.mil/ffr/housing/recp.html. 📌

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This residence in the Radford Terrace neighborhood benefits from the cooling effects of tree shading.
Forest City Military Communities—Hawaii